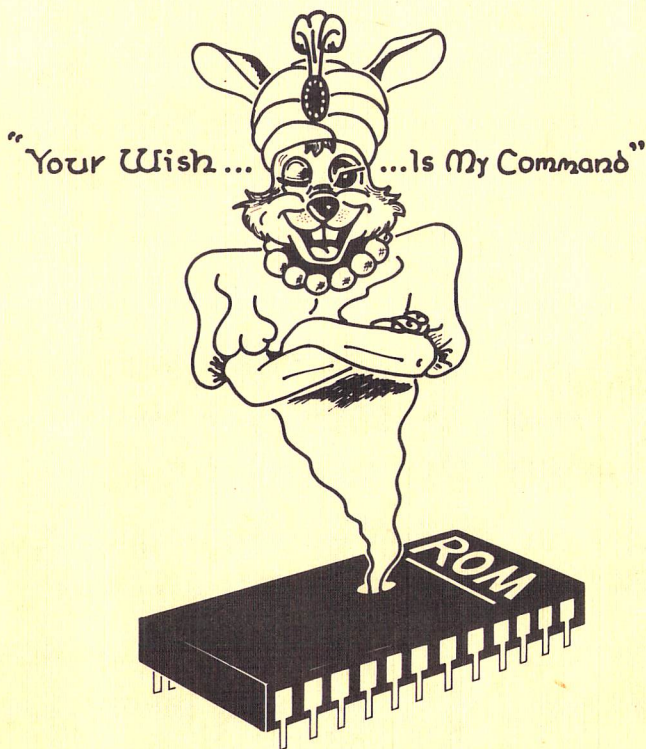


THE PET RABBIT

(Also for VIC and Commodore 64)



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VIC and Commodore 64 Rabbit Errata Sheet

If you purchased the VIC or Commodore 64 Rabbit, it was supplied to you on cassette tape. Simply insert the cassette in your tape deck and type LOAD. Your computer will then ask you to press the PLAY button. After loading has finished, type RUN to initialize the Rabbit software. Consult the manual for details on how to use the Rabbit commands.

VIC and Commodore 64 Notes

- 1-) The manual mentions that there can be two tape drives: Device 1 and 2. This applies to the older Commodore computers. The VIC and Commodore 64 hardware only supports one tape deck - device 1.
- 2-) VIC Rabbit was designed for use with VIC's that have been expanded to 8K, 24K, or 32K. Check to insure that you have the proper version. For example, the VIC Rabbit for use on VIC's with 8K of expansion memory was saved on the cassette as name: "VIC RABBIT 8K". The Commodore 64 has 64K of memory and Rabbit will work with all "64's".

INTRODUCTION:

The PET Rabbit is a programmers aid which provides 12 additional commands that can be executed in BASIC's direct mode. In addition to the commands, automatic repeat of any key held down for 0.5 seconds is also provided. This will greatly aid inputting of characters and provide more convenient cursor control.

The PET Rabbit is 2K of machine code supplied to you either on cassette or in ROM. The cassette version (available only for the 3.0 ROM 2001 PET's) occupies the top-most portion of memory and can be ordered in one of 5 locations: \$1800-\$1FFF for 8K PETs, \$3000-\$37FF or \$3800-\$3FFF for 16K PETs, and \$7000-\$77FF or \$7800-\$7FFF for 32K PETs. The reason for two different versions for the 16K and 32K PETs is to provide room for those programmers who use the DOS Support (wedge) program.

The ROM version is a 24 pin Integrated Circuit which plugs into a spare socket on the printed circuit board (old PETs don't have any spare sockets). Since the ROM version does not occupy user RAM, it will work with any 8K, 16K, or 32K new ROM PET (called 3.0 ROMs - PET model 2001) or PETs with 4.0 ROMs (model 4001 - this includes 2001 PETs upgraded from 3.0 to 4.0 and also the CBM 8032). The main advantage of the ROM Rabbit is that it doesn't have to be loaded each time you power up your PET and it does not occupy valuable RAM memory.

The PET RABBITS high-speed cassette recording feature will not work with some of Commodore's cassette decks. To be specific, cassette decks with the lift top lid (termed old style) will not work, but all other features will work. In addition, we have discovered that some new style cassette decks will not work properly. How do you know if your cassette will work? Simple - open up the cassette deck and look at the printed circuit board components. If there are IC packages for all the active components, it will work with the RABBIT. If there are any transistors on the board, it will not work. Most new style cassette decks will work okay since there are very few of the transistor types. If you purchased your tape deck within the last 2 years then you can feel sure that yours will work with the ROM Rabbit.

LOAD AND INITIALIZE CASSETTE RABBIT:

To load the cassette RABBIT from tape deck #1, type : LOAD "RAB" . To initialize the cassette RABBIT, type: RUN . RABBIT will then copy "its furry little hide" from the Basic text area to the 2K memory range you specified in your order. In addition, RABBIT will initialize Basic location HIMEM (\$34, \$35) to point to below the 2K RABBIT object code. This prevents Basic from "clobbering" the cassette RABBIT.

INSTALL AND INITIALIZE ROM RABBIT:

All new PET printed circuit boards contain spare IC sockets (some boards contain 3 others 2). Figure 1 shows the printed circuit board arrangement and the location of the IC socket used by the ROM RABBIT on 2001 & 4001 model PETs. If the PET has 3.0 ROMs, socket UD4 (\$A000-\$AFFF) is used for RABBIT. If the PET is a 4001 model, or a 2001 that has been upgraded to 4.0 ROMs, socket UD3 (\$9000-\$9FFF) is used. Figure 2 shows the printed circuit board arrangement for the 8032 CBM computer. In this case, the ROM RABBIT uses socket UD12 (\$9000-\$9FFF).

NOTE: Care must be taken, during the installation, to avoid static electricity which might destroy the the ROM. Therefore, do not install the ROM while standing on a carpeted floor, etc.

ROM INSTALLATION STEPS

- 1- Turn off power to the PET and open the cabinet.
- 2- Look at Figure 1 or 2 and your PET printed circuit board. Determine where the appropriate spare socket for you computer is located.
- 3- Pay particular attention to the orientation of the notch at the end of the ROM RABBIT chip. It should be inserted in the socket with the same notch orientation as the other PET ROMs in the row.
- 4- Simply set the ROM on top of the socket and gently press it into the socket. Check to be sure that no pins are bent.
- 5- Turn on the power and initialize the RABBIT as discussed below.

The ROM RABBIT is initialized by typing SYS 10*4096 for 3.0 ROMs or SYS 9*4096 for 4.0 ROMs and then press RETURN. The CRT will display:

```
ROM RABBIT
COPYRIGHT 1980 BY EHS
ALL RIGHTS RESERVED
```

RABBIT COMMANDS:

The following commands apply to both the cassette and ROM Rabbit.

```
*SL "name",device,start,end
or
```

```
*$ "name",device,start,end
```

Save a program in RABBIT format with a long leader.

Examples:

```
*SL "STARTREK"                < Save Basic program STARTREK
*SL "STARTREK",01             < on tape #1
```

*S "STARTREK",02 < Save on tape #2
 *S "STARTREK",1,800,FFF < Save Machine Language program
 in memory range \$0800-\$0FFF

*SS "name",device,start,end

Save a program in RABBIT format with a short leader. This is the same as *S or *SL except that a shorter leader tone is recorded.

Example:

*SS "MOUSETRAP"

NOTE: You should always use *S or *SL when saving at the start of a tape. This is because most cassettes have plastic leader material at the beginning that must be moved passed before recording data.

*L "name",device,load address

Load specified program in RABBIT format. When a program is loaded or passed over, a status message will be output (see RABBIT Note 6).

Examples:

*L < Load next program on tape #1
 *L "MAZE" < Load program named MAZE
 *L "MAZE",1 < on tape #1
 *L "FORMULA",2 < Load from tape #2
 *L "TEST",2,F00 < Load machine language but store at
 location \$0F00

NOTE: Normally a program is loaded in memory at the same location where it was previously saved. If you entered *L "TEST",2,F00 , then the program would be stored at \$0F00 no matter where it was previously saved.

*V "name",device

Verify a program to insure that a good recording was made.

Example:

*V "ADVENTURE",2 See RABBIT Note 6.

If the recording was OK then the name of the program will be displayed in reverse format. If the recording was bad, then the message CASSETTE ERROR will be displayed.

NOTE: The standard PET verify command compares the program in memory with the program on cassette. The RABBITs *V command performs this in a different manner by reading the program and checking the recorded checksum stored on tape. Thus you can verify a program and not have a copy in memory.

*E "name",device

Execute. This command is the same as the *L command except that it performs a load from tape followed with an automatic run.

Example:

*E "STARTREK",02 See RABBIT Note 6.

*H xxxx

Convert the hex number xxxx to decimal.

Example:

*H FF0 < You type
=04080 < and RABBIT responds

*D xxxxx

Convert decimal number xxxxx to hex.

Example:

*D 4080 < You type
=0FF0 < and RABBIT responds

*T test,start,end

Perform RAM memory test on memory range "start" thru "end".

Two tests can be performed:

Test 1 = Test RAM IC's for storage retention

Test 2 = Test RAM IC's for proper chip select operation

If an error is encountered, it will be output in the following format:

xxxx yy zz

Where xxxx is the address of the bad memory cell, yy is the test pattern, and zz is the error pattern. Consult the first issue of COMPUTE magazine (page 32) for more specifics on memory testing.

Examples:

*T 1,1000,1FFF < Test memory for storage retention in
 range \$1000 - \$1FFF
*T 2,400,FFF < test memory chip selects in range
 \$0400 - \$0FFF

If you want to see this command in action, try testing a portion of screen memory such as: *T 1,8000,8040

*G xxxx

Go to machine language program at hex address xxxx.

Example:

*G 1AF3

*

This is a quick and convenient way to go to the PET monitor.
Simply type * followed with a return.

*Z

Toggle lower case versus graphics character set.

*K

Kill the Rabbit. This removes the rabbit link into Basic.

RABBIT NOTES:

- 1) A tape mark can be recorded via

*SS "\$",1,0,0 < on tape deck # 1

*SS "\$",2,0,0 < on tape deck # 2

Any filename beginning with \$ will be interpreted by the RABBIT software as a tape mark. In the above example, 0,0 was tacked on the end so the recorded file will be as short as possible.

Tape marks are useful. If encountered, the RABBIT software will halt its search for a file. A tape mark should be recorded at the logical end of tape.

- 2) If you want to abort a tape load or save operation, press STOP on the cassette deck, and the message CASSETTE ERROR will appear. Sometimes you may have to press PLAY then STOP several times before the message will appear.
- 3) If you want the capability to kill the cassette RABBIT (*K command) and then later restore the RABBIT, you should (before issuing the *K command) make note of the contents of \$70, \$71, \$72. Later when you want the RABBIT restored, simply restore the three locations with the recorded value.

Use the PET monitor to restore these locations - BASIC POKE statements won't work. The ROM RABBIT is restored using the normal SYS initialization command.

- 4) Programs saved in RABBIT format can not be loaded by the Basic or Monitor load command. Conversely, programs saved by Basic or the Monitor cannot be loaded by the RABBIT load command.
- 5) The cassette RABBIT uses a number of locations in tape buffer #1 as temporary storage locations during execution of RABBIT commands. The ROM RABBIT uses tape buffer #2. The usage of the tape buffer will not affect the normal PET loading and saving of programs.
- 6) Whenever RABBIT loads a program or passes over a program on tape, a status message will be output consisting of the length of the program, the address range where loaded, and the program name. This status message will be displayed in reverse video format.
- 7) Rabbit will operate simultaneously with the BASIC PROGRAMMERS TOOLKIT (tm).
- 8) The RABBIT includes a feature which allows any key depressed for .5 seconds to be repeated. Once the RABBIT is initialized, this feature is enabled by pressing the RETURN key. In addition, whenever a cassette I/O operation is run, the repeat feature is disabled. To enable it again, simply press RETURN.

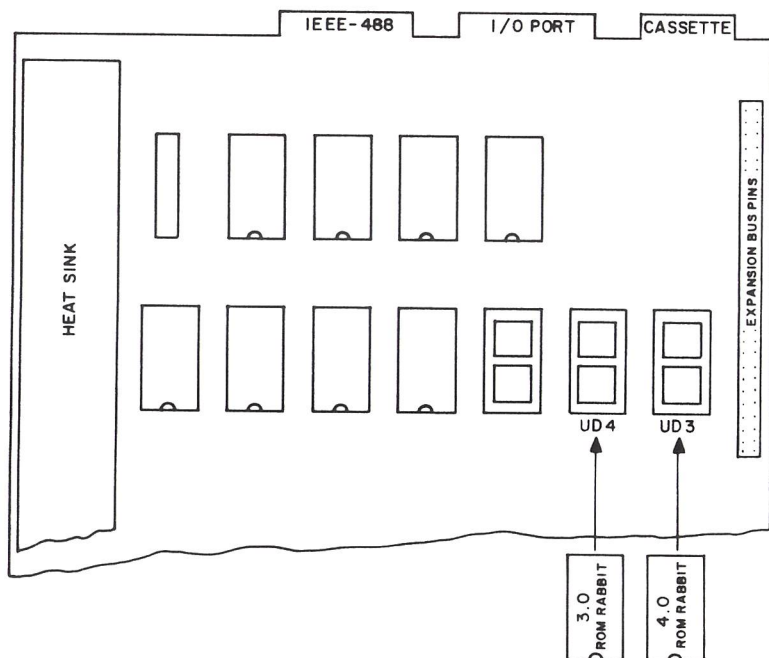


FIGURE 1
PRINTED CIRCUIT BOARD FOR 2001 AND 4001 MODELS

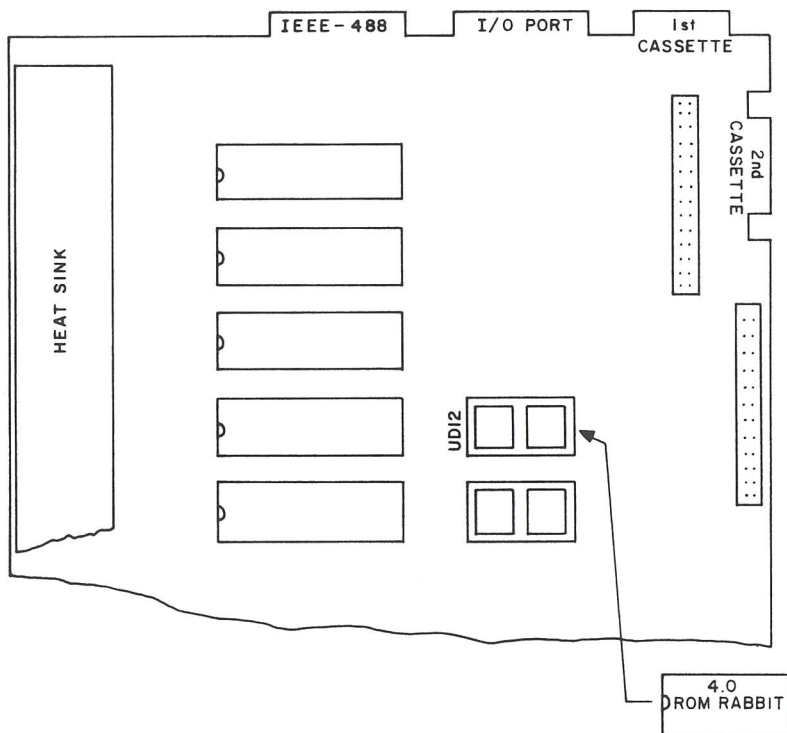


FIGURE 2
CBM 8032 PRINTED CIRCUIT BOARD

